Lamprey River Instream Flow Pilot Program

March 14, 2005

TRC Meeting

NHDES

Souhegan PISF Progress Update
Topics for the Lamprey TRC

- Hiring process
- Scope of Work (Tasks)
- Schedule
- Progress and results on individual tasks

Souhegan hiring process

- December 7, 2003 – RFQ published
- April 15, 2004 –proposals from consultants
- April 26, 2004 – interviews and selection
- May 7, 2004 – NHDES CO approval
- June 2, 2004 – G&C approves UNH-DES cooperative agreement for $354,991
- June 28, 2004 – UNH team begins field work

Scope of Work

- Describes tasks to complete PISF study and WMP
- http://www.des.state.nh.us/rivers/instream/souhegan.asp?link=reference
- Scope of Work Guidance in the RFP
- Scope of Work in UNH's proposal

First of 12 Souhegan Work Tasks Being Completed by UNH

- Task 1 - Draft IPUOCR list
- Task 2 - Surface Water and Groundwater Interactions Study
- Task 3 - On-stream survey of IPUOCR entities conducted June 28-30, 2004
- Task 4 - Report on Final IPUOCR list and Proposed Assessment Methods
- Task 5 - Assessment of IPUOCR flow needs

Souhegan River Instream Flow Study and Water Management Plan :: ERG :: UNH - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.unh.edu/erg/souhegan/

UNH Environmental Research Group | About ERG | Research | Partners | Graduate Info

erg > souhegan

Souhegan River Instream Flow Study and Water Management Plan

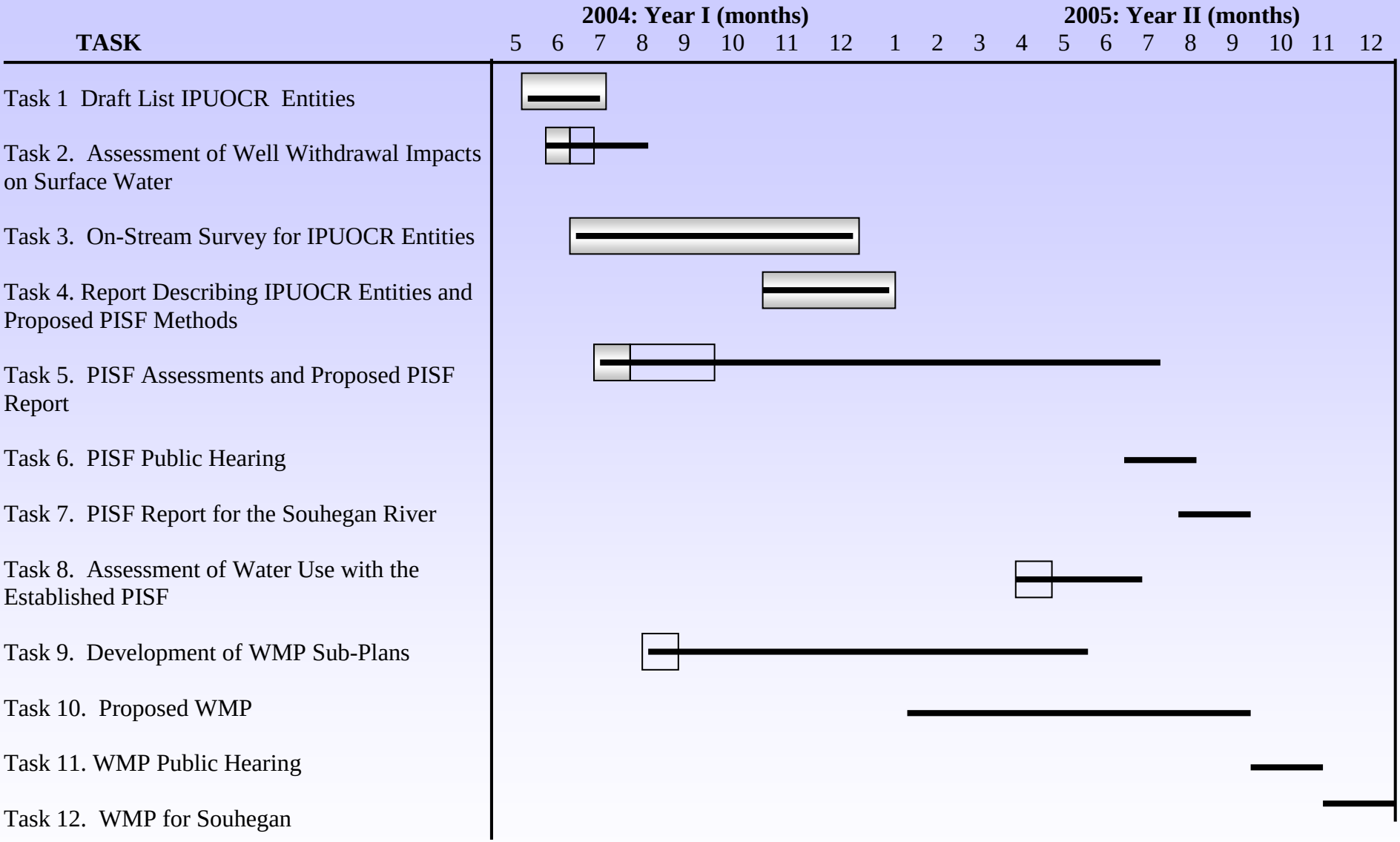
objective
statutory authority
interim products
related links
project team
contact



What's New?

- **Technical Review Committee Meeting - Groundwater Assessment**
  January 7, 2005
  - Souhegan River Protected Instream Flow Study and Water Management Plan (presentation)
- **Souhegan Water Management Planning Area Committee (WMPAAC) Meeting**
  22 October 2004, 1:30 - 3:30 PM at the Milford Town Hall, Milford, NH
  - Overview of Flow Dependent Resources, Water Users, Dam Owners and Multi-Criteria Decision Analysis (MCDA) (presentation)
  - ***Cocheco River MCDA Example***

http://www.unh.edu/erg/souhegan



January 2005

Task 1- IPUOCR list

- First task – Identify the protected entities listed in RSA 483
- UNH began with the preliminary list provided by the Department
- Conducted their own research and developed the draft IPUOCR list

Task 1- IPUOCR list

- Rec'd UNH's draft IPUOCR list June 2004 (http://www.unh.edu/erg/souhegan/19952IPUOCR_Draft6-21-04.pdf)

PRELIMINARY DRAFT
List of Instream Public Uses, Outstanding Characteristics, and Resources (IPUOCR)
Souhegan River
For the
Protected Instream Flow (PISF) Study

The New Hampshire Department of Environmental Services (DES) has defined the Instream Public Uses, Outstanding Characteristics, and Resources (IPUOCR) that must be evaluated and included in the development of a PISF Study and eventual Water Management Plan (WMP). Categories of potential IPUOCR include the following:

- Navigation: The use of the river for non-recreational, transportation purposes.
- Recreation: Use of the river for swimming, boating or significant shoreland recreation such as hiking, camping, picnicking and bird watching.
- Fishing: both Recreational Use and Commercial Use
- Storage: Natural or man-made attributes of a river for water storage.
- Conservation/Open Space: Issues concerning management of open space, conservation easements or municipal, state or federal parks.

Task 3 – On-stream Survey of IPUOCRs

- Survey of the Designated River to locate and evaluate condition of IPUOCRs
- Conducted June 28 – 30, 2004
- Follow up fieldwork as needed

Task 4 – IPUOCR and Assessment Methods Report

- "Instream Protected Uses, Outstanding Characteristics, and Resources of the Souhegan River and Proposed Protective Flow Measures for Flow Dependent Resources" October 2004
  - Final list of protected entities (IPUOCRs)
  - Proposed methods for determining flows for flow-dependent IPUOCRs

Task 2 – Groundwater and Surface Water Interaction Study

- Collect data to evaluate impacts of groundwater withdrawals on surface water
- Determine how much groundwater is coming from the river
- Status - Draft process completed and reviewed by TRC, data collection and analysis completion by March 2005, presentation of results April 1 TRC mtg.

Task 2 - Well drawing water from aquifer and from river

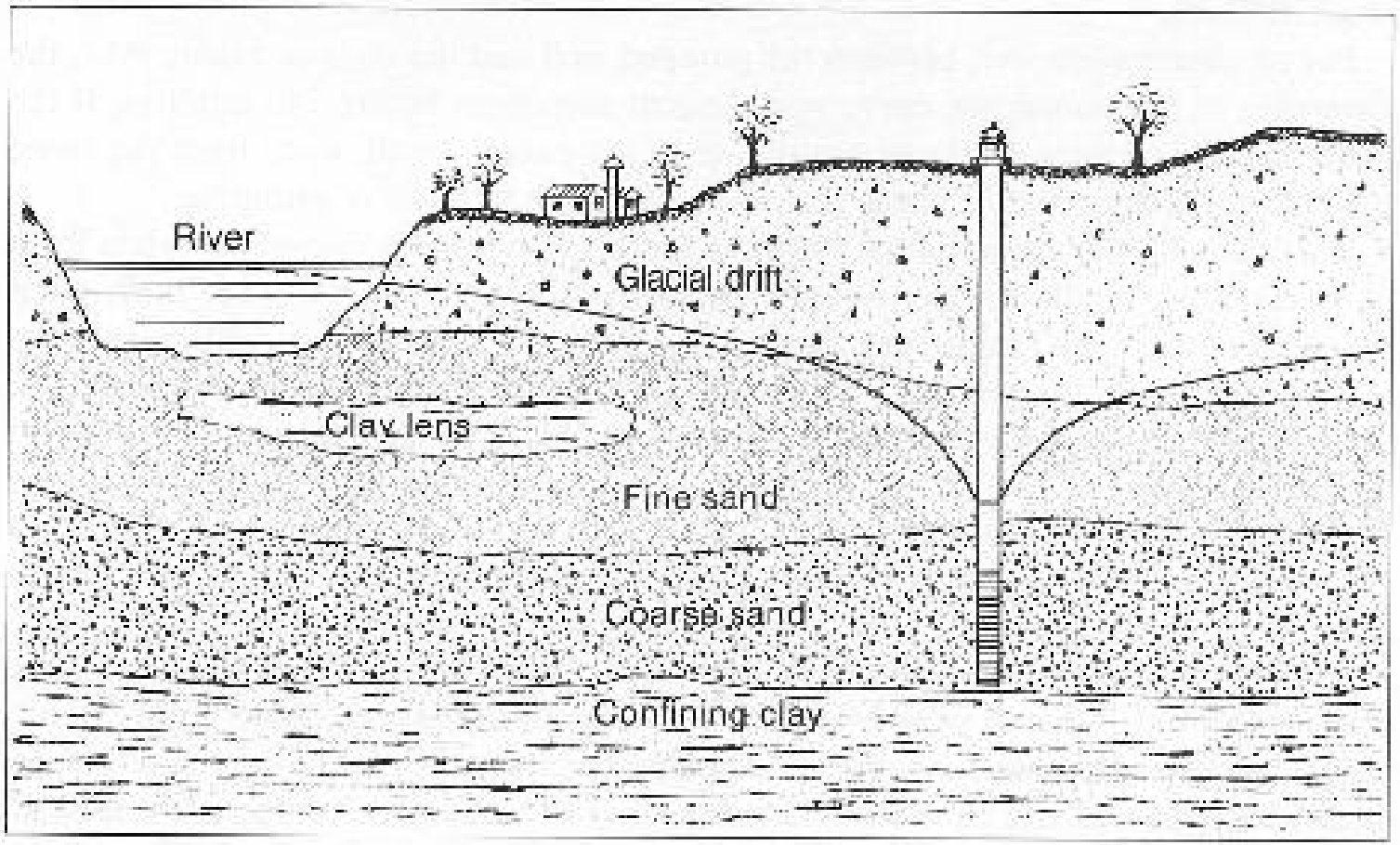
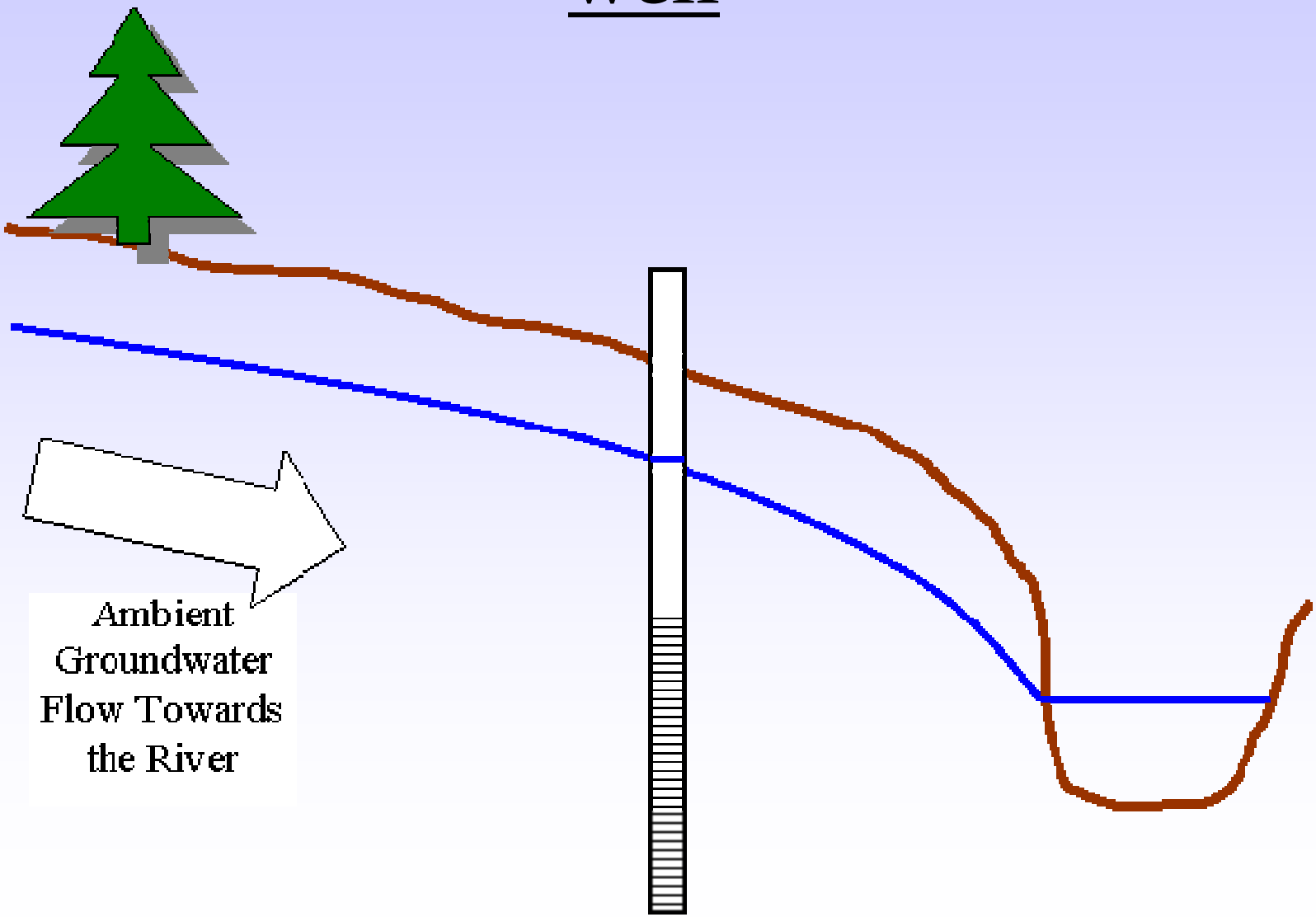
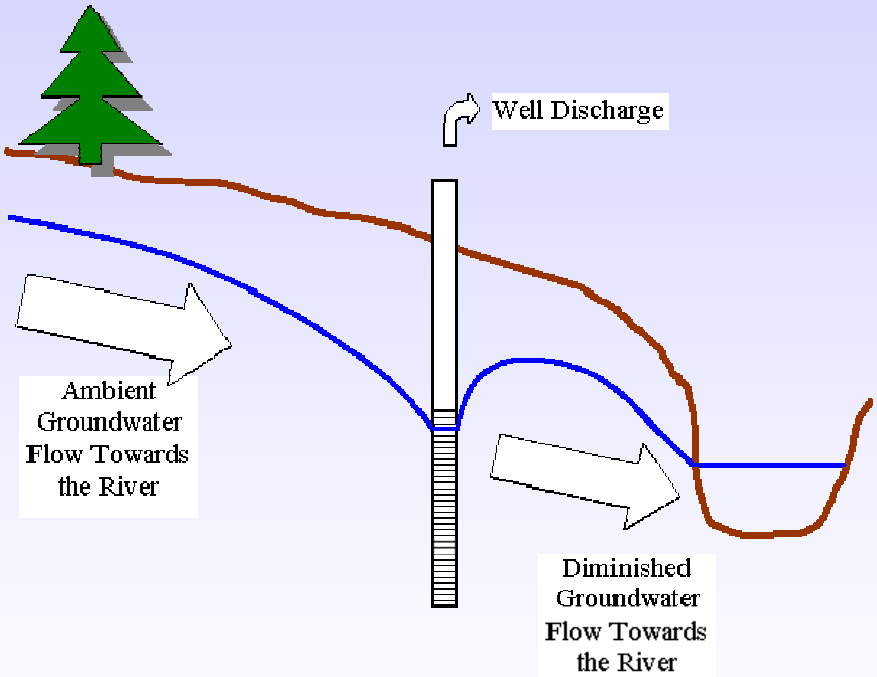


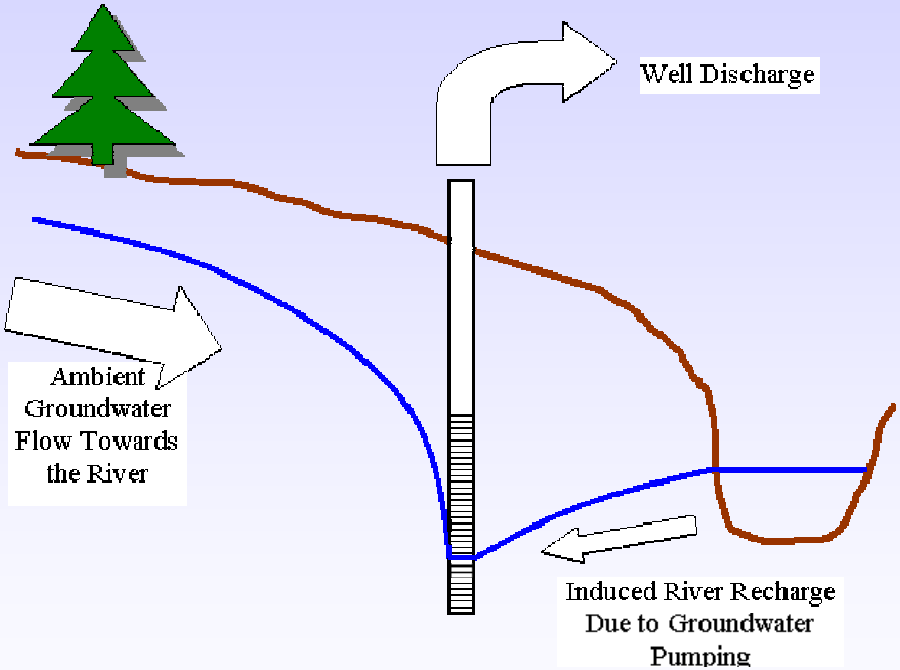
Figure 9.17. Cone of depression expanding beneath a riverbed creates a hydraulic gradient between the aquifer and river. This can result in induced recharge to the aquifer from the river.

Task 2 - Water passes non-pumping well

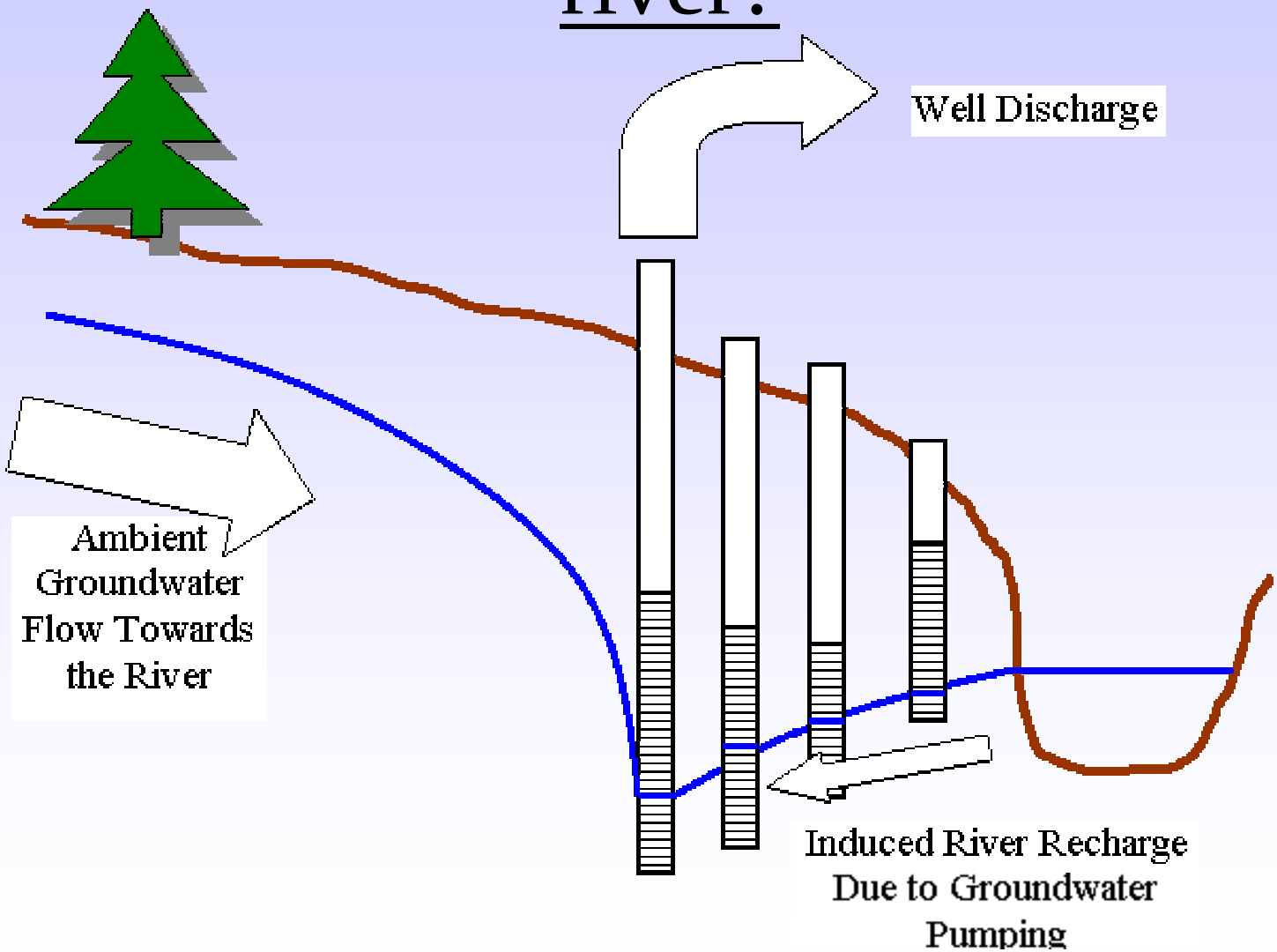


Task 2 - Two possible conditions





Task 2 - How much water from the river?



Task 2 - Part of the calculation method

Distance from well to stagnation point = x_s (feet)

$$x_s = \frac{Q}{2\pi T i}$$

Q = well pumping rate (cubic feet per day)
T = aquifer transmissivity (feet per day)
i = the slope to the groundwater table (dimensionless)

Task 2- Result

- Identify groundwater withdrawals that are inducing recharge
- Identify river reaches where impacts occur
- Evaluate whether changes of groundwater withdrawal have management uses

Task 5 – Protected Instream Flow Methods Applied

- Began field measurements in August 2004
- 2004 stream conditions higher than normal
- Field work extended to low flow period (July-August) of 2005
- Results will be the draft Protected Instream Flow Report (generic presentation at April 1 Souhegan TRC mtg.)

Task 5 - Progress

- One complete reconnaissance survey of river
- 73 sections divided into 9 reaches with 11 representative sites identified
- Two flow-based surveys completed
- Dividing river into two sections based on profile/geomorphology
- Low altitude, high resolution images collected to develop remote sensing mesohabitat mapping

Task 5 – Still to do

- Complete third (and maybe fourth) river survey at low flow conditions
- Define Reference Fish Community (RFC)
- Determination of model inputs for fish
  - identify characteristics of Souhegan riverine fish
  - 200 electrofishing grids to validate model's habitat suitability data (diving)
- Complete recreational surveys begun last year

Task 8 – Assessment of Water Use with the Established PISF
and
Task 9 – Development of WMP Sub-Plans

- Continue interviewing AWUs and ADOs to develop information base to conduct the MCDA for sub-plan development

Multi-Criteria Decision Analysis

- Iterative process to develop the WMP
- Surveys of AWUs and ADOs are used to evaluate alternatives
- Revise alternatives to find the best fit for the WMP sub-plan components

Souhegan Timeline - Projection

Task 5 – PISF Assessments and Proposed PISF Report	November 05
Task 6 – PISF Public Hearing (joint)	December 05
Task 7 – PISF Report for the Souhegan River	January 06
Task 8 – Assessment of Water Use with the Established PISF	December 05
Task 9 – Development of WMP Sub-Plans	January 06
Task 10 – Proposed WMP	February 06
Task 11 – WMP Public Hearing (joint)	January 06
Task 12 –WMP Report for the Souhegan	March 06
Department adopts WMP	May 06

Tasks and Timetable for Completion of ISF Pilot Program

By April 1, 07	**DES report to legislature (PISF and WMP reports)**
By June 1, 07	**DES/legislative committees hold public hearing(s) jointly**
By Oct 1, 07	**Lamprey and Souhegan PISFs and WMPs adopted**
By Oct 1, 08 or one year following WMPs adoption	**DES public hearing and 30-day comment period**
By Dec 1, 08	**DES final report to legislature**
By Dec 1, 08	**SB 330 report to governor and legislature**

wives@des.state.nh.us

http://www.des.state.nh.us/rivers/instream/